Math 125 — Epidemiology — In-Class Activity

Confounding and Stratification

The table shows data from a study of injuries of moped riders in Spain. (Source: *Essential Epidemiology*, p. 201, from Lardelli-Claret et al. (2003) "Position on the moped, risk of head injury and helmet use: an example of confounding effect." *International Journal of Epidemiology* **32**:162-164)

	Driver		Passenger		Total	
	Head injury	Other injury	Head injury	Other injury	Head injury	Other injury
No helmet	17,869	51,900	3,052	12,522	20,921	64,422
Helmet	7,342	86,212	485	7,971	7,827	94,183
Total	25,211	138,112	3,537	20,493	28,748	158,605

You are going to be computing six different odds ratios, listed below. Divide up the work among the people in your group.

The Six Odds Ratios

You are going to examine whether wearing a helmet is associated with head injury and whether position on the moped is associated with head injury. For each of these variables, you'll look both at the overall data and also stratifying for the other variable to avoid confounding.

Helmets and head injury?

- (1) What is the crude odds ratio for the association between not wearing a helmet (exposed) and head injury?
- Now find the odds ratio for the association between wearing a helmet and head injury, but stratified by whether the person was a driver or passenger. Is there any reason to think that position is a confounder for the relationship between wearing a helmet and head injury. That is, compute the odds ratios separately for
  - (2) the drivers and
  - (3) the passengers.

Position on the moped and head injury

- (4) What is the crude odds ratio for the association between position and head injury?
- Now stratify this by whether or not the person was wearing a helmet.
  - (5) Wearing a helmet.
  - (6) No helmet.

Basic Technique

Each person should construct a 2×2 table and fill it in with the appropriate entries from the above table. You may want to circle the numbers in the table, inserting them as A, B, C, and D.

	Cases	Controls
Exposed = .	A =	B =
Not Exposed = .	C =	D =

Odds ratio:

For each of your odds ratios, calculate a 95% confidence interval. The procedure is this:

1. From your table of counts, calculate the odds ratio: $R = ad/bc$. Calculate the natural logarithm of this, calling it L.
2. Calculate $S = \sqrt{1/a + 1/b + 1/c + 1/d}$.
3. Compute the two values upper= $L + 2S$ and lower= $L - 2S$.
4. Take exp(upper) and exp(lower) as the upper and lower bounds of your 95% confidence interval.

95% Confidence Interval: